

### ABSTRACT

A control technique for a communication system in which a microcell base station is co-located with a macrocell base station. The microcell base station tracks hot spots as they move within the macrocell. The microcell base station may utilize a two-dimensional (2-D) antenna array, which is co-located with the macro cell antenna. The two-dimensional antenna is steerable in both the horizontal and vertical directions. The size of the microcell coverage area depends upon the distance from the cell site antenna as well as the dimensionality of the array, which determines the angular spread of the beam. Filter tap weights may be adjusted to point the beam to any desired location in the macrocell. The orthogonality between the macrocell and the microcell may be obtained either in the frequency domain or in the code domain, depending upon the system in which it is implemented.

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